

## Module 3

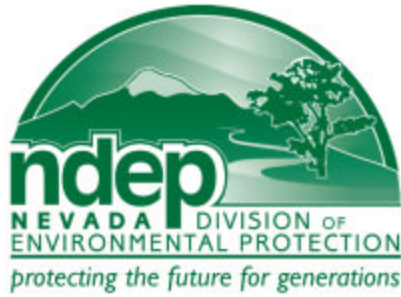
### Industrial Strength

#### Heavy Duty Recycling

## Industrial Strength

Master Materials List	M3-1m
Nevada Standard Alignment	M3-1s
References	M3-1r
Lesson 15 – <b>Pulp Non-Fiction</b> <i>Industrial Paper Recycling</i>	M3-3
Lesson 16 – <b>Solid Steel</b> <i>Aluminum and Steel Recycling</i>	M3-19
Lesson 17 – <b>Recycle, For PETE's Sake</b> <i>Plastic Recycling</i>	M3-31
Lesson 18 – <b>2800 Degrees Fahrenheit</b> <i>Glass Recycling</i> <i>(and Mercury exposure)</i>	M3-53
Lesson 19 – <b>Socrates Static</b> <i>Oral Assessment: Debate</i>	M3-79
Lesson 20 – <b>Socrates Static</b> <i>Oral Assessment: Debate</i>	M3-99

THIS PAGE WAS INTENTIONALLY LEFT BLANK



---

## Module 3

### Master Materials List

Student workbooks are used for every lesson. In nearly every lesson the white board and dry erase markers are used. Should you be inclined, transparencies can be made and used on an overhead projector with water-based markers.

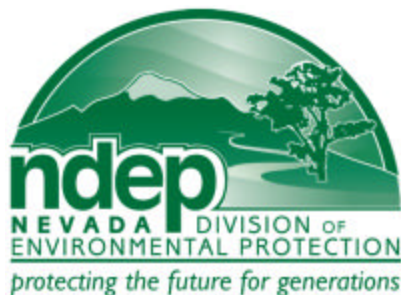
7	Bags containing colored markers
14	Pieces of butcher paper or newsprint: 3ft X 3ft
1	Aluminum can
1	Steel can



## Nevada Standard Alignment

M3-1s

Lesson	Title	Topic	<u>Nevada</u> Science	<u>Nevada</u> Language Arts	<u>Nevada</u> Geography	<u>Nevada</u> Mathematics
15	Pulp Non-Fiction	Industrial Paper Recycling	<b>N.5.B.2, P.5.A.3, L.5.C.4</b>	1.5.4, 2.5.1, 2.5.2, 2.5.3, 4.5.1, 4.5.5, 5.5.1, 5.5.5, 5.5.7, 6.5.7, 7.5.3, 7.5.5, 8.5.1, 8.5.2, 8.5.4	2.5.4, 5.5.1, 5.5.4, 6.5.4	n/a
16	Solid Steel	Aluminum and Steel Recycling	<b>N.5.B.2, P.5.A.3, P.5.A.4, P.5.B.3, L.5.C.4</b>	5.5.1, 5.5.3, 5.5.5, 6.5.3, 7.5.3, 7.5.5, 8.5.1, 8.5.2, 8.5.4	2.5.4, 5.5.1, 5.5.4, 6.5.4	n/a
17	Recycle For PETE's Sake	Plastic Recycling	<b>N.5.B.2, P.5.A.3, P.5.A.4, L.5.C.4</b>	7.5.3, 7.5.5, 8.5.1, 8.5.2, 8.5.4	2.5.4, 5.5.1, 5.5.4, 6.5.4	n/a
18	2800 Degrees Fahrenheit	Glass Recycling (and Mercury exposure)	<b>N.5.B.2, P.5.A.3, P.5.A.4, L.5.C.4</b>	1.5.4, 2.5.1, 2.5.2, 2.5.3, 4.5.1, 4.5.5, 5.5.1, 7.5.3, 7.5.5, 8.5.1, 8.5.2, 8.5.4	2.5.4, 5.5.1, 5.5.4, 6.5.4	n/a
19	Socrates Static	Assessment	<b>Assessment</b>	Assessment	Assessment	Assessment
20	Socrates Static (part 2)	Assessment	<b>Assessment</b>	Assessment	Assessment	Assessment



---

## Module 3

### Industrial Strength

### References

#### Lesson 15 – Pulp Non-Fiction

United States Environmental Protection Agency. (2006). *Municipal Solid Waste in the United States: 2005 Facts and Figures* (EPA530-R-06-011).

TAPPI. (2001). *How is Paper Recycled?*. Retrieved June 4, 2008 from [http://www.tappi.org/paperu/all\\_about\\_paper/earth\\_answers/earthAnswers\\_Recycle.pdf](http://www.tappi.org/paperu/all_about_paper/earth_answers/earthAnswers_Recycle.pdf)

#### Lesson 16 – Solid Steel

United States Environmental Protection Agency. (2006). *Municipal Solid Waste in the United States: 2005 Facts and Figures* (EPA530-R-06-011).

Oregon Department of Environmental Quality. (2001). *Lesson 15: All About Aluminum*. Retrieved May 28, 2008 from <http://www.deq.state.or.us/lq/pubs/docs/sw/curriculum/RRPart0315.pdf>

#### Lesson 17 – Recycle, For PETE's Sake

United States Environmental Protection Agency. (2006). *Municipal Solid Waste in the United States: 2005 Facts and Figures* (EPA530-R-06-011).

American Chemistry Council. (2007). *Plastic Packaging Resins*. Retrieved May 28, 2008 from [http://www.americanchemistry.com/s\\_plastics/bin.asp?CID=1102&DID=4645&DOC=FILE.PDF](http://www.americanchemistry.com/s_plastics/bin.asp?CID=1102&DID=4645&DOC=FILE.PDF)

## Lesson 18 – **2800 Degrees Fahrenheit**

United States Environmental Protection Agency. (2006). *Municipal Solid Waste in the United States: 2005 Facts and Figures (EPA530-R-06-011)*.

Glass Packaging Institute. (2005). *FAQ'S*. Retrieved May 28, 2008 from <http://www.gpi.org/recycling/faq/>

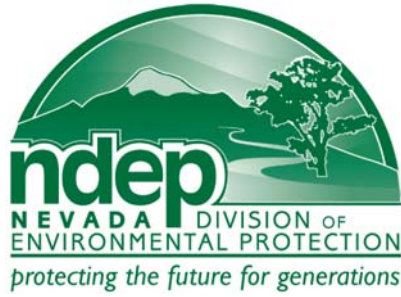
Nevada Division of Environmental Protection. (2005). *What You Need to Know About Mercury*. [Brochure]. Carson City, NV: Author.

## Lesson 19 – **Socrates Static**

static. (2008). In *Merriam-Webster Online Dictionary*. Retrieved June 5, 2008, from <http://www.merriam-webster.com/dictionary/static>

## Lesson 20 – **Socrates Static**

No works referenced for this lesson.



# Lesson 15

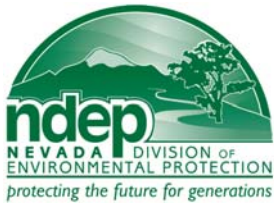
## Pulp Non-Fiction

Industrial Paper Recycling

Support Document	Teaching Strategies	<b>M3-5</b>
Lesson 15	Activity	<b>M3-7</b>
Support Document	Vocabulary	<b>M3-10</b>
Support Document	Student Worksheets	<b>M3-11</b>







#### Teaching Strategies

# Pulp Non-Fiction

## Industrial Paper Recycling

### Teaching Strategies

#### Group Discovery

The group work is effective for all levels of learners.

#### Group Makeup

Groups should be selected by the lead classroom teacher. The groups should be heterogeneous and learners of all levels should be included.

#### Group Presentations

The group presentation allows learners of all levels to practice public speaking. Each member of the group is required to participate in the presentation. The individuals with difficulty in public should be able to gain confidence with the support of other group members.

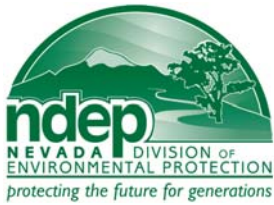
#### Artwork, Postermaking

The poster making is effective for all levels and types of learners. The posters will allow students to write, draw, graphically organize, and otherwise provide a system for information representation.

**Tip: The student worksheet can be made as a transparency for group discussion.**

---





## Solid Waste & Recycling Curriculum

### Lesson 15

**Lesson Time:**  
**60 minutes**

#### Vocabulary

**Pulp**

**De-inking**

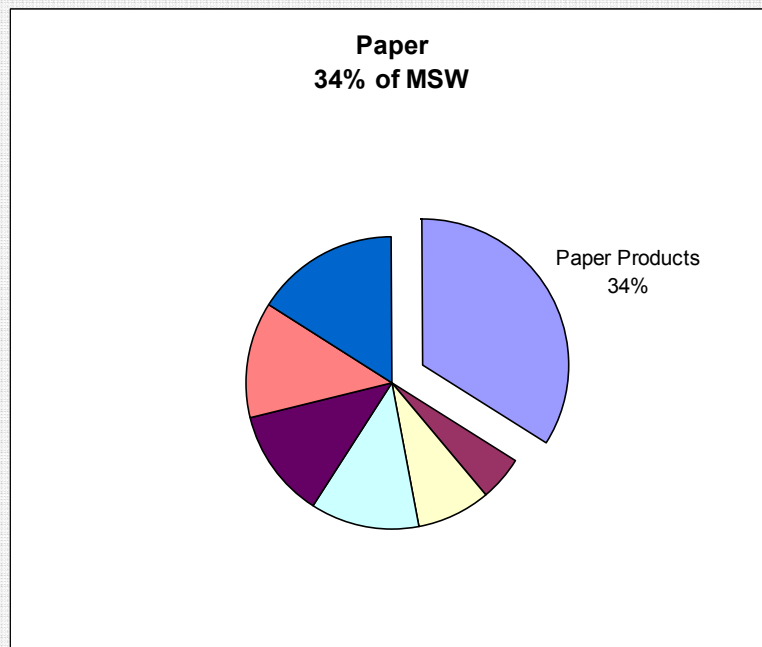
**Floatation**

**Refining**

**Virgin Fiber**

## Pulp Non-Fiction

### Industrial Paper Recycling



Data from EPA document EPA530-R-06-011 October 2006

### Objective

Students will define key vocabulary.

Students will summarize and present the paper recycling process to the class.

## Materials Needed

30	Single subject notebooks
6	Dry erase markers
1	White board
7	Fact packets
7	Bags containing colored markers
7	Pieces of paper: 3ft X 3ft

## Anticipatory Set

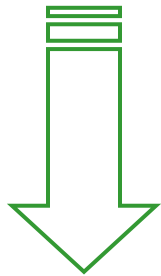
Write the lesson objectives on the white board.

Discuss with the students what the objectives of the lessons are.

Objective: You will define key vocabulary.

Objective: You will summarize and present the paper recycling process to the class.

Distribute handouts (or workbooks).



## Introduction:

“Today we are going to learn about how paper is recycled. We have already recycled paper during our papermaking lesson. We are now going to look at how industry recycling is done.”

## Modeling / Guided Practice

1. Have the students take out their workbooks (or handouts).
2. Discuss the key vocabulary for the lesson. Have the students write the definitions on their worksheets.
3. Arrange the students into seven pre-selected groups.
4. Arrange the group's desks together into a square table.
5. Have one student from each group come up to the front of the room to get a 3ft X 3ft piece of paper.

## **Modeling / Guided Practice**

6. Have one student from each group come up to the front of the room to get a bag of colored markers.
7. Assign each group to write / draw / map (summarize the information)  
The required recycling information is included in the student worksheets.
8. Explain to the students that they will need to convey the most important information from their worksheet to teach the other groups about the steps in the process. Each group's steps are unique.
9. Scaffold for support.

When the students have completed their summary:

10. Have the first group come to the front of the class.
11. Have them present their poster.
12. Continue this procedure until all of the groups have presented.
13. Be prepared to “fill in” any information to describe the process that the presenters may have omitted.

### **Closure:**

1. Take a few minutes to do a quick review of paper recycling
2. Add any other facts that did not get presented.
3. Check for understanding.

### **Independent Practice**

1. Not applicable.

### Support Document

# Pulp Non-Fiction

## Industrial Paper Recycling

### Vocabulary

**Pulp:** a soft wet mass of fibers derived from wood, used in papermaking.

**De-inking:** the process of removing ink from the paper pulp.

**Floatation:** a process in de-inking where air and soap-like chemicals are injected into the pulp. This removes the large particles of ink from the pulp and floats them to the top of the vat.

**Refining:** the separation of pulp into individual fibers.

**Virgin Fiber:** new wood fibers.

**Objectives:** I will define key vocabulary.  
I will summarize and present the paper recycling process to the class.

## **Vocabulary**

Pulp:

De-inking:

Floatation:

Refining:

Virgin Fiber:

---

## **Group 1**

**The following material is quoted directly from EarthAnswers\_Recycle.pdf. The text was generated by TAPPI and can be found by following the link below:**

**[http://www.tappi.org/paperu/all\\_about\\_paper/earth\\_answers/earthAnswers.htm](http://www.tappi.org/paperu/all_about_paper/earth_answers/earthAnswers.htm)**

### **Sorting**

Successful recycling requires clean recovered paper, so you must keep your paper free from contaminants, such as food, plastic, metal, and other trash, which make paper difficult to recycle. Contaminated paper which cannot be recycled must be composted, burned for energy, or landfilled.

Recycling centers usually ask that you sort your paper by grade, or type of paper. Your local recycling center can tell you how to sort paper for recycling in your community. To locate your nearest dealer, look in the yellow pages of your phone book under "waste paper" or "recycling."

### **Collection and Transportation**

You may take your sorted paper to a local recycling center or recycling bin. Often, a paper stock dealer or recycling center will collect recovered paper from your home or office. Your local dealer can tell you the options available in your community.

At the recycling center, the collected paper is wrapped in tight bales and transported to a paper mill, where it will be recycled into new paper.



## **Group 2**

**The following material is quoted directly from EarthAnswers\_Recycle.pdf. The text was generated by TAPPI and can be found by following the link below:**

**[http://www.tappi.org/paperu/all\\_about\\_paper/earth\\_answers/earthAnswers.htm](http://www.tappi.org/paperu/all_about_paper/earth_answers/earthAnswers.htm)**

### **Storage**

Paper mill workers unload the recovered paper and put it into warehouses, where it is stored until needed. The various paper grades, such as newspapers and corrugated boxes, are kept separate, because the paper mill uses different grades of recovered paper to make different types of recycled paper products.

When the paper mill is ready to use the paper, forklifts move the paper from the warehouse to large conveyors.

### **Re-pulping and Screening**

The paper moves by conveyor to a big vat called a pulper, which contains water and chemicals. The pulper chops the recovered paper into small pieces. Heating the mixture breaks the paper down more quickly into tiny strands of cellulose (organic plant material) called fibers. Eventually, the old paper turns into a mushy mixture called pulp.

The pulp is forced through screens containing holes and slots of various shapes and sizes. The screens remove small contaminants such as bits of plastic and globs of glue. This process is called screening.

### **Group 3**

**The following material is quoted directly from EarthAnswers\_Recycle.pdf. The text was generated by TAPPI and can be found by following the link below:**

**[http://www.tappi.org/paperu/all\\_about\\_paper/earth\\_answers/earthAnswers.htm](http://www.tappi.org/paperu/all_about_paper/earth_answers/earthAnswers.htm)**

#### **Cleaning**

Mills also clean pulp by spinning it around in large cone-shaped cylinders. Heavy contaminants like staples are thrown to the outside of the cone and fall through the bottom of the cylinder. Lighter contaminants collect in the center of the cone and are removed. This process is called cleaning.

#### **Deinking**

Sometimes the pulp must undergo a "pulp laundering" operation called deinking (de-inking) to remove printing ink and "stickies" (sticky materials like glue residue and adhesives). Papermakers often use a combination of two deinking processes. Small particles of ink are rinsed from the pulp with water in a process called washing. Larger particles and stickies are removed with air bubbles in another process called flotation. During flotation deinking, pulp is fed into a large vat called a flotation cell, where air and soap-like chemicals called surfactants are injected into the pulp. The surfactants cause ink and stickies to loosen from the pulp and stick to the air bubbles as they float to the top of the mixture. The inky air bubbles create foam or froth which is removed from the top, leaving the clean pulp behind.

## **Group 4**

The following material is quoted directly from EarthAnswers\_Recycle.pdf. The text was generated by TAPPI and can be found by following the link below:

[http://www.tappi.org/paperu/all\\_about\\_paper/earth\\_answers/earthAnswers.htm](http://www.tappi.org/paperu/all_about_paper/earth_answers/earthAnswers.htm)

### **Refining, Bleaching and Color Stripping**

During refining, the pulp is beaten to make the recycled fibers swell, making them ideal for papermaking. If the pulp contains any large bundles of fibers, refining separates them into individual fibers. If the recovered paper is colored, color stripping chemicals remove the dyes from the paper.

Then, if white recycled paper is being made, the pulp may need to be bleached with hydrogen peroxide, chlorine dioxide, or oxygen to make it whiter and brighter. If brown recycled paper is being made, such as that used for industrial paper towels, the pulp does not need to be bleached.

### **Papermaking**

Now the clean pulp is ready to be made into paper. The recycled fiber can be used alone, or blended with new wood fiber (called virgin fiber) to give it extra strength or smoothness.

The pulp is mixed with water and chemicals to make it 99.5% water. This watery pulp mixture enters the headbox, a giant metal box at the beginning of the paper machine, and then is sprayed in a continuous wide jet onto a huge flat wire screen which is moving very quickly through the paper machine.

## **Group 5**

**The following material is quoted directly from EarthAnswers\_Recycle.pdf. The text was generated by TAPPI and can be found by following the following link:**

**[http://www.tappi.org/paperu/all\\_about\\_paper/earth\\_answers/earthAnswers.htm](http://www.tappi.org/paperu/all_about_paper/earth_answers/earthAnswers.htm)**

### **Papermaking (cont.)**

On the screen, water starts to drain from the pulp, and the recycled fibers quickly begin to bond together to form a watery sheet. The sheet moves rapidly through a series of felt-covered press rollers which squeeze out more water.

The sheet, which now resembles paper, passes through a series of heated metal rollers which dry the paper. If coated paper is being made, a coating mixture can be applied near the end of the process, or in a separate process after the papermaking is completed. coating gives paper a smooth, glossy surface for printing.

Finally, the finished paper is wound into a giant roll and removed from the paper machine. One roll can be as wide as 30 feet and weigh as much as 20 tons! The roll of paper is cut into smaller rolls, or sometimes into sheets, before being shipped to a converting plant where it will be printed or made into products such as envelopes, paper bags, or boxes.

## **Group 6**

**The following material is quoted directly from EarthAnswers\_Recycle.pdf. The text was generated by TAPPI and can be found by following the link below:**

**[http://www.tappi.org/paperu/all\\_about\\_paper/earth\\_answers/earthAnswers.htm](http://www.tappi.org/paperu/all_about_paper/earth_answers/earthAnswers.htm)**

### **Can all of my recovered paper be recycled?**

As much as 80% of the content of typical recovered paper can actually be used in the recycling process, but 20% cannot. A lot of what's contained in a bale of recovered "paper" isn't paper! Trash, such as wire, staples, paper clips, and plastic, must be removed during pulping, cleaning, and screening. This trash is usually sent to a landfill, just like your trash at home.

Recovered paper contains some fibers which have become too small to be recycled into paper. Your recovered paper may contain fibers which already have been recycled one [*sic*], twice, or perhaps several times! Wood fibers can only be recycled five to seven times before they become too short and brittle to be made into new paper.

Recovered paper contains many other ingredients which are not paper fibers. Just take a look at a magazine and you'll see what we mean. The printed pages contain lots of ink. If the pages are shiny, that portably [*sic*] means they are coated with clay or other materials. Magazines also contain adhesives which bind the pages together. Ink, coatings, and adhesives must be removed from the paper before recycled paper can be produced.

### **Group 7**

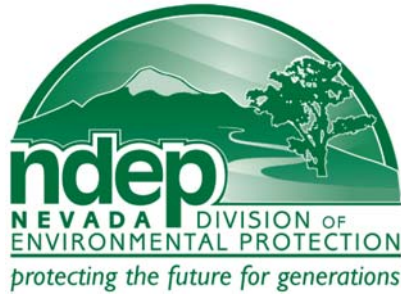
**The following material is quoted directly from EarthAnswers\_Recycle.pdf. The text was generated by TAPPI and can be found by following the following link:**

**[http://www.tappi.org/paperu/all\\_about\\_paper/earth\\_answers/earthAnswers.htm](http://www.tappi.org/paperu/all_about_paper/earth_answers/earthAnswers.htm)**

#### **What can be made from recovered paper?**

Most recovered paper is recycled back into paper and paperboard products. With a few exceptions, recovered paper is generally recycled into a grade similar to, or of lower quality than, the grade of the original product. For example, old corrugated boxes are used to make new recycled corrugated boxes. Recovered printing and writing paper can be used to make new recycled copy paper.

Recovered paper can be used in a variety of other products as well. Recycled pulp can be molded into egg cartons and fruit trays. Recovered paper can be used for fuel, ceiling and wall insulation, paint filler, and roofing. Nearly 100,000 tons of shredded paper is used each year for animal bedding. Even cat litter can be made from recovered paper!



# Lesson 16

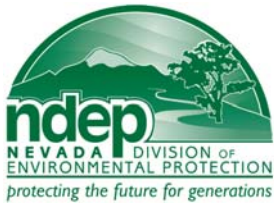
## Solid Steel

Aluminum and Steel Recycling

Support Document	Teaching Strategies	<b>M3-21</b>
Lesson 16	Lecture / Activity	<b>M3-23</b>
Support Document	Fact Sheet	<b>M3-27</b>
Support Document	Performance Piece	<b>M3-28</b>
	Parameters	
Support Document	Student Worksheets	<b>M3-29</b>







## Solid Waste & Recycling Curriculum

### Lesson 16

#### Teaching Strategies

# Solid Steel

## Aluminum and Steel Recycling

### Teaching Strategies

#### Group Discovery

The group work is effective for all levels of learners.

#### Group Makeup

Groups should be selected by the lead classroom teacher. The groups should be heterogeneous and learners of all levels should be included.

#### Group Presentations

The group presentation allows learners of all levels to practice public speaking. Each member of the group is required to participate in the presentation. The individuals with difficulty in public should be able to gain confidence with the support of other group members.

#### Small Group Discussion

The small group work is effective for all levels of learners. Discussion and collaboration will allow all students to participate. It will also allow individual students to hear another classmate's ideas in a relaxed setting (they will not be afraid of sharing information).

#### Lecture

This strategy is effective for all levels of learners. During the lecture, an alternative may be to use the overhead (use student worksheet as a transparency).

---

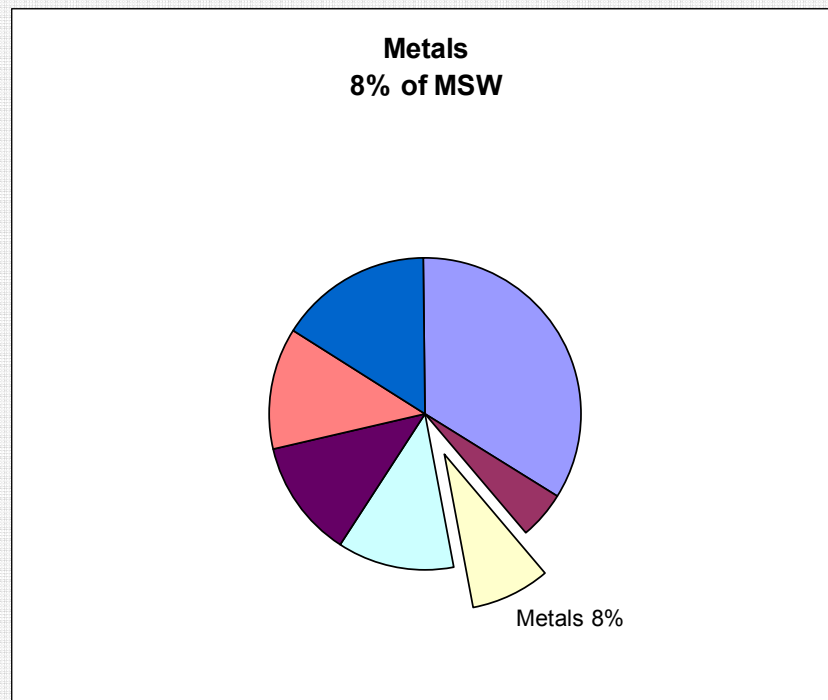
**Tip: The student worksheet can be made as a transparency for group discussion.**



**Lesson Time:**  
**60 minutes**

# Solid Steel

## Aluminum and Steel Recycling



Data from EPA document EPA530-R-06-011 October 2006

## Objective

- Students will be able to identify aluminum and steel cans.
- Students will know how to recycle cans in Northern Nevada.
- Students will compose a poem, song, or other performance piece about metal cans.

## Materials Needed

30	Single subject notebooks
6	Dry erase markers
1	White board
1	Aluminum can
1	Steel can

## Anticipatory Set

Write the lesson objectives on the white board.

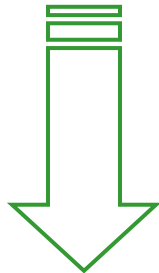
Discuss with the students what the objectives of the lessons are.

Objective: You will be able to identify aluminum and steel cans.

Objective: You will know how to recycle cans in Northern Nevada.

Objective: You will compose a poem, song, or other performance piece about metal cans.

Distribute handouts (or workbooks).



## Introduction:

“Today we are going to talk about aluminum and steel recycling. Let us look first at the characteristics of aluminum and steel. We will then talk about how you can properly recycle them. Finally, you are going to write and perform a poem, song, or other performance piece.”

## Modeling / Guided Practice

1. At the board (or overhead), draw a T-chart.
2. Label one side Aluminum and the other Steel.
3. Ask the students to tell you some of the characteristics of aluminum cans.
4. If they have difficulty, direct the discussion.  
(see support document)
5. Use an aluminum can as a guide
6. Write these characteristics in the T-chart.

## **Modeling / Guided Practice**

7. Ask the students to tell you some of the characteristics of steel cans.
8. If they have difficulty, direct the discussion.  
(see support document)
9. Use steel can as a guide.
10. Write these characteristics in the T-chart.
11. Ask the students to tell you how to recycle aluminum cans in Northern Nevada.
12. If they have difficulty, direct the discussion.  
(see support document)
13. Write these characteristics in the T-chart.
14. Ask the students to tell you how to recycle steel cans in Northern Nevada.
15. If they have difficulty, direct the discussion.  
(see support document)
16. Write these characteristics in the T-chart.
17. Explain to the students they are going to write poem, song, or other performance piece, using the information on the board.
18. Explain to the students the parameters to which they must adhere.  
(see support document)
19. Divide the students into groups of five.
20. Give the students 20 minutes to write and practice their performance piece.
21. Call the students back to their desks.
22. Explain the behavior expected during the performances.
23. Call upon each group to perform.

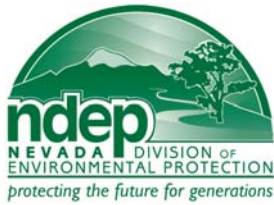


### **Closure:**

1. Take a few minutes to do a quick review of Aluminum and steel recycling.
2. Check for understanding.

### **Independent Practice**

1. Not applicable.
- 



### Support Document

# Solid Steel

## Aluminum and Steel Recycling

### Fact Sheet

#### Identification and local recycling

<u>Aluminum</u>	<u>Tin(99% Steel)</u>
Not magnetic	Magnetic
Bottom does not have rim	Bottom has rim
Brushed, polished appearance	Shiny, silver appearance
Body is shiny, silver, and smooth	Body has rings or ribbing
No seams on body	Always has seam on body
Label usually sprayed on	Label is usually paper, glued on
Lighter in weight	Heavier in weight
Curbside pickup	Curbside pickup
Transfer station drop off	Transfer station drop off
Yellow bin	Yellow bin

You can include any other observations that the students suggest.

### Support Document

# Solid Steel

## Aluminum and Steel Recycling

### Performance piece parameters

The writing should be appropriate for school and should not contain foul language or sexual connotation.

The students should choose either aluminum or steel.  
(They can do both if they so desire).

The piece should include at least 6 facts.

The piece should be performed by the group as a whole. If there is a student who does not want to speak during the performance, this is acceptable.

The students will have a maximum of 60 seconds to perform their creation.

### **Audience parameters**

The students will be quiet and respectful.

There will be no laughing (unless intended) or teasing.

Students should treat others as they want to be treated.



# Solid Waste and Recycling Curriculum

## Lesson 16

Name: \_\_\_\_\_

### Solid Steel

Date: \_\_\_\_\_

**Objectives:** I will able to identify aluminum and steel cans.  
I will know how to recycle cans in Northern Nevada.  
I will compose a poem, song, or other performance piece about metal cans.

<u>Aluminum</u>	<u>Tin (99% Steel)</u>

## **Solid Waste and Recycling Curriculum**

### **Lesson 16**

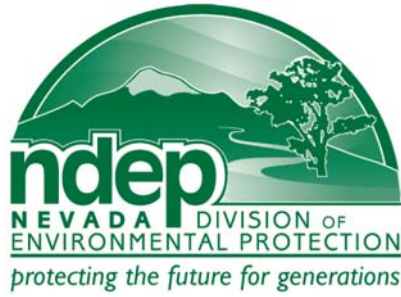
#### **Solid Steel**

**Name:**\_\_\_\_\_

**Date:**\_\_\_\_\_

### **Performance Piece**

Please write draft of your performance piece here.



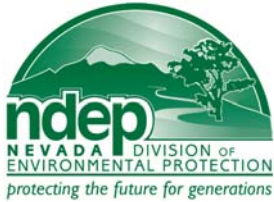
# Lesson 17

## Recycle, For PETE's Sake

### Plastic Recycling

Support Document	Getting the materials ready—materials prep	<b>M3-33</b>
Support Document	Teaching Strategies	<b>M3-35</b>
Lesson 17	Lecture / Activity	<b>M3-37</b>
Support Document	Fact Sheets	<b>M3-41</b>
Support Document	Worksheet Key	<b>M3-48</b>
Support Document	Student Worksheets	<b>M3-49</b>





#### Pre-lesson

# Recycle, For PETE's Sake

## Plastic Recycling

3ft X 3ft data sheets for plastic recycling

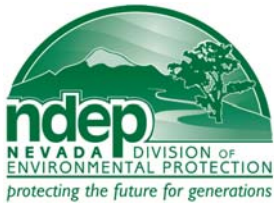
### Materials Needed

1	Package colored markers
7	3ft X 3ft newsprint
7	data sheets (about plastics)

1. Using the colored markers, transfer the information from the data sheets onto the newsprint (see support documents).
2. Print on one side of the newsprint only.

There should be 7 data sheets upon completion.





#### Teaching Strategies

# Recycle, For PETE's Sake

## Plastic Recycling

### Teaching Strategies

#### Group Discovery

The group work is effective for all levels of learners.

#### Group Makeup

Groups should be selected by the lead classroom teacher. The groups should be heterogeneous and learners of all levels should be included.

#### Small Group Discussion

The small group work is effective for all levels of learners. Discussion and collaboration will allow all students to participate. It will also allow individual students to hear another classmate's ideas in a relaxed setting (they will not be afraid of sharing information).

#### Worksheets

Worksheets are provided to guide the students through the lesson. The lead teacher may prefer the students to take their own notes.

For below level learners and special ed, the teacher may consider having the worksheets filled out for these students. This would be done before class by the teacher or by having an advanced student help.

---

**Tip: The student worksheet can be made as a transparency for group discussion.**

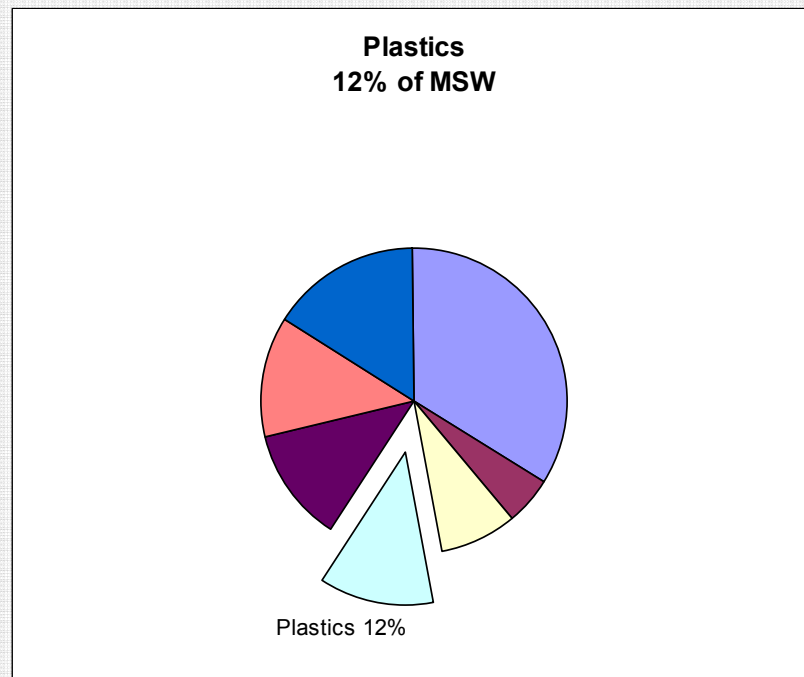




**Lesson Time:**  
**60 minutes**

# Recycle, For PETE's Sake

## Plastic Recycling



Data from EPA document EPA530-R-06-011 October 2006

### Objective

Students will know there are different types of plastic.  
Students will complete a chart containing the characteristics of different plastics.  
Students will answer questions about plastic based on their completed chart.

## Materials Needed

30	Single subject notebooks
6	Dry erase markers
1	White board
7	3ft X3ft Fact sheets (data)

## Anticipatory Set

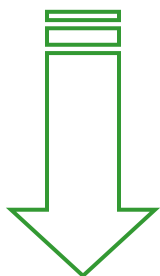
Write the lesson objectives on the white board (or show on overhead).  
Discuss with the students what the objectives of the lessons are.

Objective: You will know there are different types of plastic.

Objective: You will complete a chart containing the characteristics of different plastics.

Objective: You will answer questions about plastic based on their completed chart.

Distribute handouts (or workbooks)



## Introduction:

“Today we are going to talk about plastic. There are different types of plastics that are made for different uses. Let us take a look at these plastics and see if they can be recycled in Nevada.”

## Modeling / Guided Practice

1. The students should be in pre-selected groups of five.
2. Arrange the group's desks into a square table.
3. Have one of the students from each group come up to the front of the room to get a 3ft X 3ft data sheet.
4. Have the students spread the sheet out on the desks.

## Modeling / Guided Practice

6. Explain to the students that they are to record the data from the 3ft X 3ft onto their worksheet (data).
7. Explain that after 3 minutes, they are to get up and move to the next table.  
(The table with plastic 1 will move to plastic 2. The table with plastic 7 will move to plastic 1.)
8. This will continue until each student has visited all 7 tables.
9. Check for understanding.
10. Have the students begin. After 3 minutes, tell them to move to the next table.
11. Scaffold for support.
12. When the students are finished collecting data, have them return to their original tables.
13. Have the students complete the questions on their worksheets.
14. Scaffold for support.
15. When the students have completed the worksheets, discuss.



### **Closure:**

1. Take a few minutes to do a quick review of plastic recycling.
2. Check for understanding.

### **Independent Practice**

1. Not applicable.
- 

# Recycled Into

Carpet  
Fleece Jackets  
Food Containers

## Examples

Water Bottles  
Soda Bottles  
Food Jars  
Clothes  
Carpet

# 1

## PETE

## Polyethylene Terephthalate

## Properties

Clear  
Shatter Resistant  
Moisture Barrier Properties

## Recycled in Northern Nevada?

**YES!**  
Curbside Pickup  
Transfer Station Dropoff

**BOTTLE FORM ONLY**

# Recycled Into

Shampoo Bottles  
Plastic Lumber  
Recycling Bins

## Examples

Milk Bottles  
Laundry Detergent Bottles  
Cereal Box Liners  
Grocery Bags

# 2

## HDPE

### High Density Polyethylene

## Recycled in Northern Nevada?

YES!

Curbside Pickup  
Transfer Station Dropoff

BOTTLE FORM ONLY

Retail Outlets

GROCERY BAGS ONLY

## Properties

Relatively Stiff  
Translucent  
Moisture Barrier Properties

## Recycled Into

Pipe  
Decking  
Fencing  
Floor Tiles

## Examples

Food Packaging  
Shrink Wrap  
Pipe  
Blood Bags  
Medical Tubing

# 3

## PVC

## Polyvinyl Chloride

## Properties

High Impact Strength  
Brilliant Clarity  
Rigid and Flexible

## Recycled in Northern Nevada?

**NO!**  
NO Curbside Pickup  
NO Transfer Station Dropoff

## Recycled Into

Garbage Bags  
Compost Bins  
Trash Cans  
Furniture

## Examples

Bread Bags  
Produce Bags  
Shrink Wrap  
Coating for Milk Cartons  
Coating for Paper Cups

# 4

## LDPE

### Low Density Polyethylene

## Properties

Relatively Tough  
Flexible  
Relative Transparency

## Recycled in Northern Nevada?

**NO!**  
NO Curbside Pickup  
NO Transfer Station Dropoff



## Recycled Into

Car Signal Lights  
Ice Scrapers  
Oil Funnels  
Garden Rakes

## Examples

Margarine Container  
Yogurt Container  
Medicine Bottles  
Bottle Caps

5  
PP

Polypropylene

## Properties

Good Clarity  
Strong  
Moisture Barrier Properties

Recycled in Northern  
Nevada?

**NO!**  
NO Curbside Pickup  
NO Transfer Station Dropoff

# Recycled Into

Insulation

Camera Cases

Wood Replacement Products

## Examples

Insulated Cups

Protective Packaging

Packing Peanuts

Some Toys

6

PS

Polystyrene

## Properties

Stiff

Hard

Brittle

Good Moisture Barrier

Recycled in Northern  
Nevada?

**NO!**

NO Curbside Pickup

NO Transfer Station Dropoff

# Recycled Into

Bottles

Plastic Lumber

## Examples

Reusable Water Bottles  
Oven Baking Bags  
Custom Packaging

7  
OTHER

Multi-Layered Plastic

## Properties

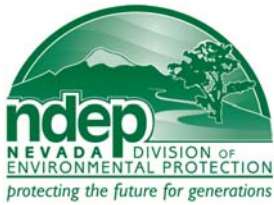
Depends on Resins Used

Recycled in Northern  
Nevada?

NO!

NO Curbside Pickup

NO Transfer Station Dropoff



**Support  
Document**

**Worksheet  
Key**

# Recycle, For PETE's Sake

## Plastic Recycling

1. There are 2 types of plastic that are picked up by the curbside recycling program in Northern Nevada. What are they? (You can give their resin code or the scientific name).

**#1 – PETE**

**#2 – HDPE**

2. There is another location, besides curbside, to take these two plastics for recycling. What is it called?

**Transfer station**

3. Plastic 2, HDPE, is also commonly used to make grocery bags. Where can you take grocery bags for recycling?

**Retail outlets**

4. What type of plastic is used to make ice scrapers?

**#5 – PP**

5. Is this plastic recyclable in Northern Nevada?

**No**

6. Which plastic is recycled into insulation?

**#6 – PP**

7. List one of the products made with recycled plastic 7.

**Plastic Lumber, bottles**

8. List 3 properties of plastic 4, LDPE.

**Tough, flexible, transparent**




**Objectives:** I will know there are different types of plastic.  
I will complete a chart containing the characteristics of different plastics.  
I will answer questions about plastic based on their completed chart.

1. There are 2 types of plastic that are picked up by the curbside recycling program in Northern Nevada. What are they? (You can give their resin code or the scientific name).
  
2. There is another location, besides curbside, to take these two plastics for recycling. What is it called?
  
3. Plastic 2, HDPE, is also commonly used to make grocery bags. Where can you take grocery bags for recycling?
  
4. What type of plastic is used to make ice scrapers?
  
5. Is this plastic recyclable in Northern Nevada?
  
6. Which plastic is recycled into insulation?
  
7. List one of the products made with recycled plastic 7.
  
8. List 3 properties of plastic 4, LDPE.

**Lesson 17**

**Recycle, For PETE's Sake**




**Date:** \_\_\_\_\_

Recycling in Northern Nevada			
Recycled Products			
Examples			
Properties			
Scientific Name			
Resin Code			

**Lesson 17**




**Recycle, For PETE's Sake**

**Date:** \_\_\_\_\_

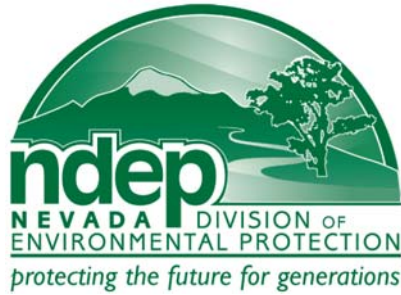
Recycling in Northern Nevada			
Recycled Products			
Examples			
Properties			
Scientific Name			
Resin Code			

**Lesson 17****Recycle, For PETE's Sake**

Date: \_\_\_\_\_

Recycling in Northern Nevada			
Recycled Products			
Examples			
Properties			
Scientific Name			
Resin Code			





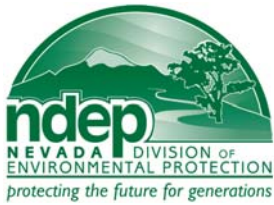
# Lesson 18

## 2800 Degrees Fahrenheit

Glass Recycling (and Mercury Exposure)

Support Document	Teaching Strategies	<b>M3-55</b>
Lesson 18	Activity	<b>M3-57</b>
Support Document	Vocabulary	<b>M3-60</b>
Support Document	Test Question	<b>M3-61</b>
	Guidelines	
Support Document	Facts – Glass and Mercury	<b>M3-62</b>
Support Document	Student Worksheets	<b>M3-67</b>





#### Teaching Strategies

# 2800 Degrees Fahrenheit

## Glass Recycling (and Mercury Exposure)

### Teaching Strategies

#### Whole Group Discussion

Many lead teachers have popsicle sticks with students names on them for “random” selection of students. Use the name sticks to draw names to answer or ask whole group discussion questions.

#### Small Group Discussion / Shoulder Partners

The small group work is effective for all levels of learners. The discussion of individual answers will allow all students to participate. It will also allow individual students to hear another classmate’s ideas in a more relaxed setting (they will not be afraid of sharing information).

#### Worksheets

Worksheets are provided to guide the students through the lesson. The lead teacher may prefer the students to take their own notes.

For below level learners and special ed, the teacher may consider having the worksheets filled out for these students. This would be done before class by the teacher or by having an advanced student help.

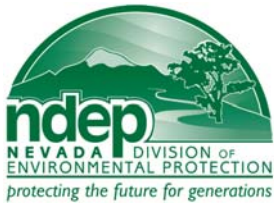
#### Discussion questions

For below level learners and special ed, the teacher may consider grouping the students together. Read the text aloud and discuss. Help them put their thoughts on paper.

---

**Tip: The student worksheet can be made as a transparency for group discussion.**





## Solid Waste & Recycling Curriculum

### Lesson 18

**Lesson Time:**  
**60 minutes**

#### Vocabulary

Raw material

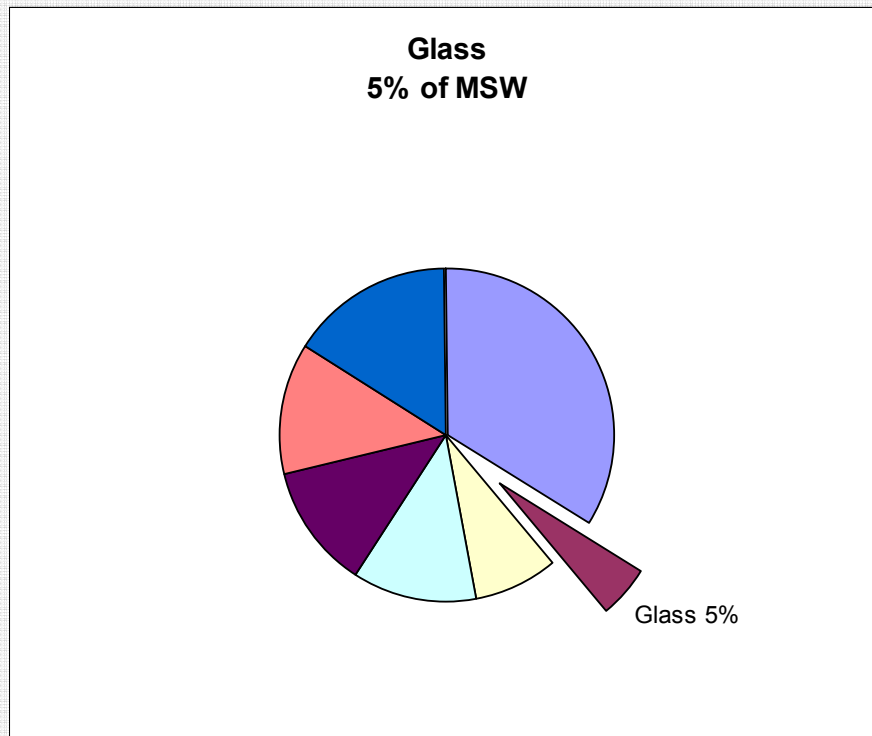
Cullet

Mercury

Amalgam

# 2800 Degrees Fahrenheit

## Glass Recycling (and Mercury Exposure)



Data from EPA document EPA530-R-06-011 October 2006

## Objective

Students will examine facts about glass recycling.  
Students will be exposed to facts about proper mercury disposal.  
Students will translate text into test questions.

## Materials Needed

30	Single subject notebooks
6	Dry erase markers
1	White board

## Anticipatory Set

Write the lesson objectives on the white board.

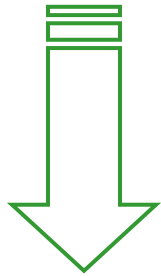
Discuss with the students what the objectives of the lessons are.

Objective: You will examine facts about glass recycling.

Objective: You will know be exposed to facts about proper mercury disposal.

Objective: You will translate text into test questions.

Distribute handouts (or workbooks).



## Introduction:

“Today we are going to talk about glass recycling. Glass is man-made and is produced by using natural raw materials. These materials are a non-renewable resource, but the glass can be recycled forever...”

## Modeling / Guided Practice

1. Have the students write “test” questions based on the information in the packets.  
(See support sheet)
2. Scaffold for support.
3. After 20 minutes, have the students pair up.

## **Modeling / Guided Practice**

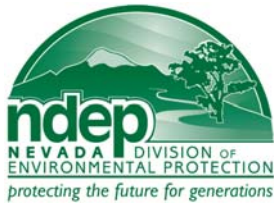
4. The students should discuss their questions with each other, looking for differences in questions / answers.
5. After approximately 10 minutes regain the attention of the class.
6. The teacher should return to the front of the class.
7. The teacher should call on students to quiz him/her with their questions about for 15 minutes.
8. Go over with the class any information they did not cover with their questions.
9. Check for understanding.

### **Closure:**

1. Take a few minutes to do a quick review of glass recycling.
2. Check for understanding.

### **Independent Practice**

1. Not applicable.



#### Support Document

# 2800 Degrees Fahrenheit

## Glass Recycling (and Mercury Exposure)

### Vocabulary

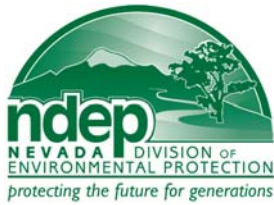
**Raw Material:** according to Merriam-Webster, a raw material is crude or processed material that can be converted by manufacture, processing, or combination into a new and useful product  
<wheat...is *raw material* for the flour mill -- C. A. Koepke>

**Cullet:** furnace ready scrap glass.

**Mercury:** is an element and a metal. Mercury is the only liquid metal at room temperature. It is toxic to the central nervous system.

**Amalgam:** according to Merriam-Webster, amalgam is an alloy of mercury with another metal that is solid or liquid at room temperature according to the proportion of mercury present. It is used especially as a dental cavity filling material.





### Support Document

# 2800 Degrees Fahrenheit

## Glass Recycling (and Mercury Exposure)

### Test question guidelines

The purpose of this exercise is to have the students learn the information on their own. The students will become “experts” on the material in order to be able stump the teacher.

There should be two questions from each handout page. There should be a total of 10 questions.

Questions already listed are not acceptable.  
i.e. How are glass bottles and jars made?

The students should write down the answers to the questions.  
If the teacher answers incorrectly, the student must be able to prove the teacher wrong by giving the correct answer.

### Support Document

# 2800 Degrees Fahrenheit

## Glass Recycling (and Mercury Exposure)

### Clear Facts

Glass containers are an environmentally superior packaging—nontoxic, high value, and completely recyclable.

### 100% recyclable

- Glass can be recycled again and again with no loss in quality or purity. Glass containers go from recycling bin to store shelf in as little as 30 days—again and again.
- In 2005, glass made up 5.2% of the municipal solid waste stream by weight, and of that, 25.3% of glass containers were recycled.
- 

### The environmental choice

- Made from domestically plentiful, nontoxic raw materials—silica, sand, soda ash, limestone and up to 70% recycled glass—glass is one of the safest packaging materials.
- And, recycling glass reduces consumption of raw materials, extends the life of plant equipment, such as furnaces, and saves energy.

### Superior, light-weight packaging

- Today's glass containers are also more than 40% lighter than they were 20 years ago.

This document was taken directly from  
<http://www.gpi.org/recycling/faq/>

**Q. HOW ARE GLASS BOTTLES AND JARS MADE?**

A. Glass is made from readily-available domestic materials, such as sand, soda ash, limestone and “cullet,” the industry term for furnace-ready scrap glass. The only material used in greater volumes than cullet is sand. These materials are mixed, or “batched,” heated to a temperature of 2600 to 2800 degrees Fahrenheit and molded into the desired shape

**Q. HOW DOES RECYCLING FIT INTO THE  
MANUFACTURING PROCESS?**

A. Recycled glass is substituted for up to 70% of raw materials. Manufacturers benefit from recycling in several ways—it reduces emissions and consumption of raw materials, extends the life of plant equipment, such as furnaces, and saves energy.

**Q. WHY IS MORE RECYCLED CONTAINER GLASS NEEDED?**

A. Because glass manufacturers require high-quality recycled container glass to meet market demands for new glass containers. Cullet is always part of the recipe for glass, and the more that is used, the greater the decrease in energy used in the furnace. This makes using cullet profitable in the long run, lowering costs for glass container manufacturers—and benefiting the environment.

**This document was taken directly from  
<http://www.gpi.org/recycling/faq/>**

**Q. WHAT TYPES OF GLASS CAN BE RECYCLED? WHAT ARE THE INDUSTRY STANDARDS FOR CULLET?**

A. Glass containers, such as those for food and beverages, can be recycled. Other types of glass, like windows, ovenware, Pyrex, crystal, etc. are manufactured through a different process. If these materials are introduced into the manufacturing process, they can cause production problems and defective containers.

Furnace-ready cullet must also be free of contaminants such as metals, ceramics, gravel, stones, etc. Color sorting makes a difference, too.

Glass manufacturers are limited in the amount of mixed cullet they can use to manufacture new containers. Separating recycled container glass by color allows the industry to ensure that new bottles match the color standards required by glass container customers.

**Q. IS THERE A WAY TO REUSE GLASS THAT CONTAINER MANUFACTURERS CAN'T ACCEPT?**

A. Cullet that doesn't meet container manufacturing standards and non-container glass are used in tile, filtration, sand blasting, concrete pavements and parking lots, decorative items, and fiber glass.

**This document was taken directly from  
<http://www.gpi.org/recycling/faq/>**

**Mercury** is a metal. It is the only metal that is liquid at room temperature.

Mercury can be absorbed through the skin.

Because mercury can become a gas at room temperature, you must also be careful not to breathe in the mercury gas.

### **How to Handle a Small Mercury Spill**

#### **Tell a responsible adult.**

**Do not play with it.**

**Open windows and doors that vent to the outdoors.**

Immediately remove children from the area.

**If unsure of what to do at anytime during the spill call the NDEP Spill Reporting Hotline at 888-331-6637.**

**For all other mercury disposal concerns contact the Recycling Hotline at 1-800-597-5865**

#### **Ever wonder where the term "mad as a hatter" came from?**

Mercury, was once used in the hat making process. It caused a brain illness in many hatters. Mercury removed fur from pelts to turn it into felt more easily. Hat makers began to experience its effects on their nervous systems. Doctors even recorded seeing "holes the size of quarters" inside some hatters' brains.

**Information taken directly from Nevada Division of Environmental Protection's informational brochure about mercury.**

## **Mercury Containing Products**

### **Batteries**

Certain alkaline batteries prior to 1998  
Button batteries

### **Measuring Devices**

Thermometers  
Thermostats  
Barometers  
Manometers  
Certain switches

### **Lighting**

Fluorescent lamps  
Mercury vapor lamps  
High-pressure sodium lamps  
Metal halide lamps & neon lamps  
Strobe lights.

### **Dental Amalgam**

Mercury is used in dental fillings because it is durable, inexpensive and able to bond with some metals.  
Alternative fillings are made of gold, porcelain, ceramic or plastics.

### **Historical Uses**

Certain pigments of latex and oil-based paints pre 1991  
Pesticides / fungicides  
Felt hat manufacturing

**Information taken directly from Nevada Division of Environmental Protection's informational brochure about mercury.**

**Objectives:** I will examine facts about glass recycling.  
I will be exposed to facts about proper mercury disposal.  
I will translate text into test questions.

**Please write 2 test questions and answers from page M3-68.**

1.

2.

**GLASS Clear Facts**

Glass containers are an environmentally superior packaging—nontoxic, high value, and completely recyclable.

**100% recyclable**

- Glass can be recycled again and again with no loss in quality or purity. Glass containers go from recycling bin to store shelf in as little as 30 days—again and again.
- In 2005, glass made up 5.2% of the municipal solid waste stream by weight, and of that, 25.3% of glass containers were recycled.
- 

**The environmental choice**

- Made from domestically plentiful, nontoxic raw materials—silica, sand, soda ash, limestone and up to 70% recycled glass—glass is one of the safest packaging materials.
- And, recycling glass reduces consumption of raw materials, extends the life of plant equipment, such as furnaces, and saves energy.
- 

**Superior, light-weight packaging**

Today's glass containers are also more than 40% lighter than they were 20 years ago.

This document was taken directly from  
<http://www.gpi.org/recycling/faq/>



**Please write 2 test questions and answers from page M3-70.**

1.

2.

**Q. HOW ARE GLASS BOTTLES AND JARS MADE?**

A. Glass is made from readily-available domestic materials, such as sand, soda ash, limestone and “cullet,” the industry term for furnace-ready scrap glass. The only material used in greater volumes than cullet is sand. These materials are mixed, or “batched,” heated to a temperature of 2600 to 2800 degrees Fahrenheit and molded into the desired shape.

**Q. HOW DOES RECYCLING FIT INTO THE MANUFACTURING PROCESS?**

A. Recycled glass is substituted for up to 70% of raw materials. Manufacturers benefit from recycling in several ways—it reduces emissions and consumption of raw materials, extends the life of plant equipment, such as furnaces, and saves energy.

**Q. WHY IS MORE RECYCLED CONTAINER GLASS NEEDED?**

A. Because glass manufacturers require high-quality recycled container glass to meet market demands for new glass containers. Cullet is always part of the recipe for glass, and the more that is used, the greater the decrease in energy used in the furnace. This makes using cullet profitable in the long run, lowering costs for glass container manufacturers—and benefiting the environment.

**This document was taken directly from  
<http://www.gpi.org/recycling/faq/>**

**Please write 2 test questions and answers from page M3-72.**

1.

2.

**Q. WHAT TYPES OF GLASS CAN BE RECYCLED? WHAT ARE THE INDUSTRY STANDARDS FOR CULLET?**

A. Glass containers, such as those for food and beverages, can be recycled. Other types of glass, like windows, ovenware, Pyrex, crystal, etc. are manufactured through a different process. If these materials are introduced into the manufacturing process, they can cause production problems and defective containers.

Furnace-ready cullet must also be free of contaminants such as metals, ceramics, gravel, stones, etc. Color sorting makes a difference, too. Glass manufacturers are limited in the amount of mixed cullet they can use to manufacture new containers. Separating recycled container glass by color allows the industry to ensure that new bottles match the color standards required by glass container customers.

**Q. IS THERE A WAY TO REUSE GLASS THAT CONTAINER MANUFACTURERS CAN'T ACCEPT?**

A. Cullet that doesn't meet container manufacturing standards and non-container glass are used in tile, filtration, sand blasting, concrete pavements and parking lots, decorative items, and fiber glass.

**This document was taken directly from  
<http://www.gpi.org/recycling/faq/>**

**Please write 2 test questions and answers from page M3-74.**

1.

2.

**Mercury** is a metal. It is the only metal that is liquid at room temperature.

Mercury can be absorbed through the skin.

Because mercury can become a gas at room temperature, you must also be careful not to breathe in the mercury gas.

**How to Handle a Small  
Mercury Spill**

**Tell a responsible adult.**

**Do not play with it.**

**Open windows and doors that vent to the outdoors.**

**Immediately remove children from the area.**

**If unsure of what to do at anytime during the spill call the NDEP Spill Reporting Hotline at 888-331-6637.**

**For all other mercury disposal concerns contact the Recycling Hotline at 1-800-597-5865**

**Ever wonder where the term "mad as a hatter" came from?**

Mercury, was once used in the hat making process. It caused a brain illness in many hatters. Mercury removed fur from pelts to turn it into felt more easily. Hat makers began to experience its effects on their nervous systems. Doctors even recorded seeing "holes the size of quarters" inside some hatters' brains.

**Information taken directly from Nevada Division of Environmental Protection's informational brochure about mercury.**

**Please write 2 test questions and answers from page M3-76.**

1.

2.

## **Mercury Containing Products**

### **Batteries**

Certain alkaline batteries prior to 1998  
Button batteries

### **Measuring Devices**

Thermometers  
Thermostats  
Barometers  
Manometers  
Certain switches

### **Lighting**

Fluorescent lamps  
Mercury vapor lamps  
High-pressure sodium lamps  
Metal halide lamps & neon lamps  
Strobe lights.

### **Dental Amalgam**

Mercury is used in dental fillings because it is durable, inexpensive and able to bond with some metals.  
Alternative fillings are made of gold, porcelain, ceramic or plastics.

### **Historical Uses**

Certain pigments of latex and oil-based paints pre 1991  
Pesticides / fungicides  
Felt hat manufacturing

**Information taken directly from Nevada Division of Environmental Protection's informational brochure about mercury.**



**Solid Waste and Recycling Curriculum**

**Lesson 18**

**2800 Degrees Fahrenheit**

**Name:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Notes from discussion with partner.**

Any new questions?

---

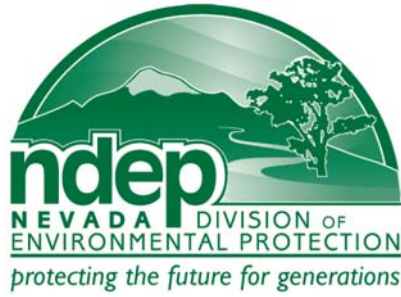
**Solid Waste and Recycling Curriculum**

**Lesson 18**

**2800 Degrees Fahrenheit**

**Name:** \_\_\_\_\_

**Date:** \_\_\_\_\_



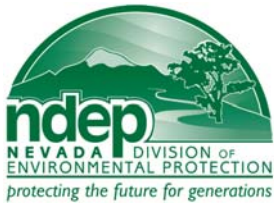
# Lesson 19

## Socrates Static

Oral Assessment: Debate

Support Document	Teaching Strategies	<b>M3-81</b>
Lesson 19	Activity	<b>M3-83</b>
Support Document	Rules	<b>M3-86</b>
Support Document	Topics	<b>M3-87</b>
Support Document	Rubric	<b>M3-89</b>
Support Document	Student Worksheets	<b>M3-93</b>





## Solid Waste & Recycling Curriculum

### Lesson 19

#### Teaching Strategies

# Socrates Static

## Oral Assessment: Debate

### Teaching Strategies

#### Small Group Discussion

The small group work is effective for all levels of learners. The discussion of the broad topics will allow all students to participate. It will also allow individual students to hear another classmate's ideas in a more relaxed setting (they will not be afraid of sharing information).

#### Rubrics

The use of a detailed rubric will allow the students to understand exactly what they are being asked to do. In this lesson, there is one rubric that can be applied to all three writing options.

The rubric will allow the instructor to easily grade the student's work. For more advanced classes, the instructor may want the students to grade their own work.

#### Group Presentations

The group presentation allows learners of all levels to practice public speaking. Each member of the group is required to participate in the presentation. The individuals with difficulty in public should be able to gain confidence with the support of other group members.

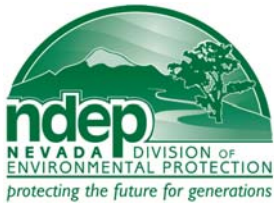
#### Debate

This activity will allow the students to process all of the information presented in class. Working in teams, the students will have support and direction. This activity will force the students to organize their thoughts and gather information. Students will also have to anticipate what the other team will present so they can effectively rebut.

---

**Tip: The student worksheet can be made as a transparency for group discussion.**





**Lesson Time:**  
**60 minutes**

# Socrates Static

**Oral Assessment: Debate**

### **Socrates:**

Ancient Greek philosopher and developer of the Socratic Method

Merriam-Webster Online Dictionary

### **Static:**

Main Entry:<sup>2</sup> static

Function: *noun*

Etymology: *static electricity*

Date: 1913

1: noise produced in a radio or television receiver by atmospheric or various natural or man-made electrical disturbances; *also* : the electrical disturbances producing this noise

2: **heated opposition or criticism**

## Objective

Students will participate in an academic debate.

Students will work in groups to prepare for the debate.

Students will review and use information presented in this class.

## Materials Needed

30	Single subject notebooks
6	Dry erase markers
1	White board

## Anticipatory Set

Write the lesson objectives on the white board.

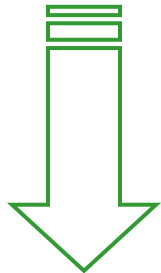
Discuss with the students what the objectives of the lessons are.

Objective: You will participate in an academic debate.

Objective: You will work in groups to prepare for the debate.

Objective: You will review and use information presented in this class.

Distribute handouts (or workbooks).



## Introduction:

“Today and next time we are going to participate in our last activity. We are going to have a debate.

Today you will argue one side of the topic. Next time you will debate the other side of the topic.”

## Modeling / Guided Practice

1. Read the rules of the debate / academic controversy
2. Divide the class into two groups.
3. Check for understanding.
4. Hand each team a topic sheet.



## **Modeling / Guided Practice**

5. Let the students know they should use all of their notes.
6. The students should discuss all possible arguments supporting their assigned topic with their teammates.
7. After 30 minutes regain the attention of the class.
8. The teacher should return to the front of the class, with the teams on either side of room.
9. Begin the debate
10. When all of the arguments are presented and rebutted, end the debate.
11. Have the students fill out the debate rubric for the other team.

### **Closure:**

1. Emphasize some of the responses that the students gave.
2. Emphasize good behavior during the academic controversy.
3. Let students know they will be arguing the other side of the argument next time.

### **Independent Practice**

1. Not applicable.

### Support Document

### Debate Rules

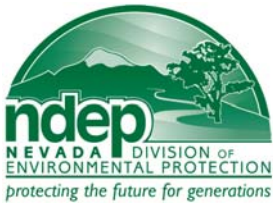
# Socrates Static

## Oral Assessment: Debate

### Rules to live by:

Be critical of ideas not people.  
Do not focus on winning—the purpose of the exercise is to learn.  
Participation strongly encouraged.  
Listen to everyone's ideas.  
Try to understand both sides of the issue.  
Keep behavior under control.

1. Divide into two groups.
2. Each half of class is given a topic that is to be discussed.
3. Teams separate to prepare their arguments.
4. Each team has 30 minutes to prepare an argument.
5. The two teams come back together.
6. One team (chosen by the teacher) presents an argument.  
There is a 5 minute time limit.  
Opposite team may not interrupt or speak.
7. The remaining team presents their counter-argument .  
(see rubric for expectations)  
There is a 5 minute time limit.  
Opposite team may not interrupt or speak.
8. This presentation / rebuttal session shall continue to go back and forth until the students have exhausted all arguments.



# Socrates Static

## Oral Assessment: Debate

### Topic

I want to start a recycling program at your school. There are some people that agree with me and some who say a recycling program is a waste of time.

### Team A:

Argue that a recycle program is a good idea. Include reasons why we should start one and how we might set up a program. Use facts that you have learned from this class.

### Team B:

Argue that a recycle program is a waste of time and resources. Include reasons why a recycle program should not be set up at your school. Use facts and opinions based on what you have learned from this class.



Teacher Copy – For scoring each side of the debate

### Socrates Static-- Debate Rubric

	<b>0</b>	<b>Needs Work 1</b>	<b>Approaching Expectations 2</b>	<b>Meets Expectations 3</b>
<b>Respect for Other Team</b>	Statements, responses and/or body language were consistently not respectful.	Most statements and responses were respectful and in appropriate language, but there was one sarcastic remark.	Statements and responses were respectful and used appropriate language, but once or twice body language was not.	All statements, body language, and responses were respectful and were in appropriate language.
<b>Information</b>	Information had several inaccuracies OR was usually not clear.	Most information presented in the debate was clear and accurate, but was not usually thorough.	Most information presented in the debate was clear, accurate and thorough.	All information presented in the debate was clear, accurate and thorough.
<b>Rebuttal</b>	Counter-arguments were not accurate and/or relevant	Most counter-arguments were accurate and relevant, but several were weak.	Most counter-arguments were accurate, relevant, and strong.	All counter-arguments were accurate, relevant and strong.

Lesson 19

## Socrates Static

Date: \_\_\_\_\_

**Socrates Static-- Debate Rubric**

	<b>0</b>	<b>Needs Work 1</b>	<b>Approaching Expectations 2</b>	<b>Meets Expectations 3</b>
<b>Use of Facts/Statistics</b>	Every point was not supported.	Every major point was supported with facts, statistics and/or examples, but the relevance of some points were questionable.	Every major point was adequately supported with relevant facts, statistics and/or examples.	Every major point was well supported with several relevant facts, statistics and/or examples.
<b>Presentation Style</b>	One or more members of the team had a presentation style that did not keep the attention of the audience.	Team sometimes used gestures, eye contact, tone of voice and a level of enthusiasm in a way that kept the attention of the audience.	Team usually used gestures, eye contact, tone of voice and a level of enthusiasm in a way that kept the attention of the audience.	Team consistently used gestures, eye contact, tone of voice and a level of enthusiasm in a way that kept the attention of the audience.
<b>Organization</b>	Arguments were not clearly tied to an idea (premise).	All arguments were clearly tied to an idea (premise) but the organization was sometimes not clear or logical.	Most arguments were clearly tied to an idea (premise) and organized in a tight, logical fashion.	All arguments were clearly tied to an idea (premise) and organized in a tight, logical fashion.
<b>Understanding of Topic</b>	The team did not show an adequate understanding of the topic.	The team seemed to understand the main points of the topic and presented those with ease.	The team clearly understood the topic in-depth and presented their information with ease.	The team clearly understood the topic in-depth and presented their information forcefully and convincingly.

**Solid Waste and Recycling Curriculum**  
**Lesson 19**

**Name:** \_\_\_\_\_

**Socrates Static**

**Date:** \_\_\_\_\_

**Socrates Static-- Debate Rubric**

**Team A Score**

	SCORE
<b>Respect for Other Team</b>	
<b>Information</b>	
<b>Rebuttal</b>	
<b>Use of Facts/Statistics</b>	
<b>Presentation Style</b>	
<b>Organization</b>	
<b>Understanding of Topic</b>	

Total points earned:	Total possible:	Percent:
	<b>21</b>	

**Solid Waste and Recycling Curriculum**  
**Lesson 19**

**Name:** \_\_\_\_\_

**Socrates Static**

**Date:** \_\_\_\_\_

**Socrates Static-- Debate Rubric**

**Team B Score**

	SCORE
<b>Respect for Other Team</b>	
<b>Information</b>	
<b>Rebuttal</b>	
<b>Use of Facts/Statistics</b>	
<b>Presentation Style</b>	
<b>Organization</b>	
<b>Understanding of Topic</b>	

Total points earned:	Total possible:	Percent:
	<b>21</b>	



Lesson 19

## Socrates Static

**Objectives:** I will participate in an academic debate.  
 I will work in groups to prepare for the debate.  
 I will review and use information presented in this class.

**Socrates Static-- Debate Rubric**

	<b>0</b>	<b>Needs Work 1</b>	<b>Approaching Expectations 2</b>	<b>Meets Expectations 3</b>
<b>Respect for Other Team</b>	Statements, responses and/or body language were consistently not respectful.	Most statements and responses were respectful and in appropriate language, but there was one sarcastic remark.	Statements and responses were respectful and used appropriate language, but once or twice body language was not.	All statements, body language, and responses were respectful and were in appropriate language.
<b>Information</b>	Information had several inaccuracies OR was usually not clear.	Most information presented in the debate was clear and accurate, but was not usually thorough.	Most information presented in the debate was clear, accurate and thorough.	All information presented in the debate was clear, accurate and thorough.
<b>Rebuttal</b>	Counter-arguments were not accurate and/or relevant	Most counter-arguments were accurate and relevant, but several were weak.	Most counter-arguments were accurate, relevant, and strong.	All counter-arguments were accurate, relevant and strong.

Lesson 19

## Socrates Static

Date: \_\_\_\_\_

**Socrates Static-- Debate Rubric**

	<b>0</b>	<b>Needs Work 1</b>	<b>Approaching Expectations 2</b>	<b>Meets Expectations 3</b>
<b>Use of Facts/Statistics</b>	Every point was not supported.	Every major point was supported with facts, statistics and/or examples, but the relevance of some points were questionable.	Every major point was adequately supported with relevant facts, statistics and/or examples.	Every major point was well supported with several relevant facts, statistics and/or examples.
<b>Presentation Style</b>	One or more members of the team had a presentation style that did not keep the attention of the audience.	Team sometimes used gestures, eye contact, tone of voice and a level of enthusiasm in a way that kept the attention of the audience.	Team usually used gestures, eye contact, tone of voice and a level of enthusiasm in a way that kept the attention of the audience.	Team consistently used gestures, eye contact, tone of voice and a level of enthusiasm in a way that kept the attention of the audience.
<b>Organization</b>	Arguments were not clearly tied to an idea (premise).	All arguments were clearly tied to an idea (premise) but the organization was sometimes not clear or logical.	Most arguments were clearly tied to an idea (premise) and organized in a tight, logical fashion.	All arguments were clearly tied to an idea (premise) and organized in a tight, logical fashion.
<b>Understanding of Topic</b>	The team did not show an adequate understanding of the topic.	The team seemed to understand the main points of the topic and presented those with ease.	The team clearly understood the topic in-depth and presented their information with ease.	The team clearly understood the topic in-depth and presented their information forcefully and convincingly.

**Topic**

**I want to start a recycling program at your school. There are some people that agree with me and some who say a recycling program is a waste of time.**

**Team A:**

**Argue that a recycle program is a good idea. Include reasons why we should start one and how we might set up a program. Use facts that you have learned from this class.**

**Team B:**

**Argue that a recycle program is a waste of time and resources. Include reasons why a recycle program not be set up at your school. Use facts and opinions based on what you have learned from this class.**

**Solid Waste and Recycling Curriculum**

**Lesson 19**

**Socrates Static**

**Name:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Initial Arguments**

**Solid Waste and Recycling Curriculum**

**Lesson 19**

**Socrates Static**

**Name:** \_\_\_\_\_

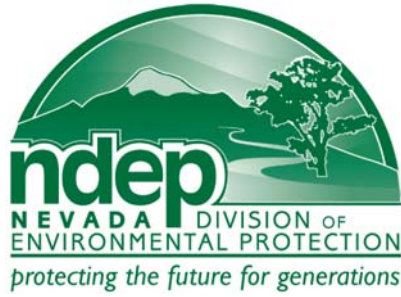
**Date:** \_\_\_\_\_

**Counter-argument**

**Socrates Static-- Debate Rubric****Team Score**

	SCORE
<b>Respect for Other Team</b>	
<b>Information</b>	
<b>Rebuttal</b>	
<b>Use of Facts/Statistics</b>	
<b>Presentation Style</b>	
<b>Organization</b>	
<b>Understanding of Topic</b>	

Total points earned:	Total possible: <b>21</b>	Percent:
----------------------	------------------------------	----------



# Lesson 20

## Socrates Static

Oral Assessment: Debate  
Day 2

Support Document	Teaching Strategies	<b>M3-101</b>
Lesson 20	Activity	<b>M3-103</b>
Support Document	Rules	<b>M3-106</b>
Support Document	Topics	<b>M3-107</b>
Support Document	Rubric	<b>M3-109</b>
Support Document	Student Worksheets	<b>M3-113</b>





### Teaching Strategies

# Socrates Static

## Oral Assessment: Debate Day 2

### Teaching Strategies

#### Small Group Discussion

The small group work is effective for all levels of learners. The discussion of the broad topics will allow all students to participate. It will also allow individual students to hear another classmate's ideas in a more relaxed setting (they will not be afraid of sharing information).

#### Rubrics

The use of a detailed rubric will allow the students to understand exactly what they are being asked to do. In this lesson, there is one rubric that can be applied to all three writing options.

The rubric will allow the instructor to easily grade the student's work. For more advanced classes, the instructor may want the students to grade their own work.

#### Group Presentations

The group presentation allows learners of all levels to practice public speaking. Each member of the group is required to participate in the presentation. The individuals with difficulty in public should be able to gain confidence with the support of other group members.

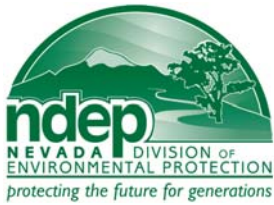
#### Debate

This activity will allow the students to process all of the information presented in class. Working in teams, the students will have support and direction. This activity will force the students to organize their thoughts and gather information. Students will also have to anticipate what the other team will present so they can effectively rebut.

---

**Tip:** The student worksheet can be made as a transparency for group discussion.





**Lesson Time:**  
**60 minutes**

# Socrates Static

**Oral Assessment: Debate**  
**Day 2**

**The academic controversy.**

**Today we argue the other side.**

## Objective

Students will participate in an academic debate.  
Students will work in groups to prepare for the debate.  
Students will review and use information presented in this class.

## Materials Needed

30	Single subject notebooks
6	Dry erase markers
1	White board

## Anticipatory Set

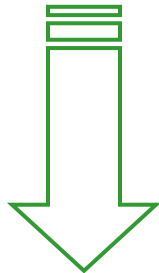
Write the lesson objectives on the white board.  
Discuss with the students what the objectives of the lessons are.

Objective: You will participate in an academic debate.

Objective: You will work in groups to prepare for the debate.

Objective: You will review and use information presented in this class.

Distribute handouts (or workbooks).



## Introduction:

“Today we are going to argue the other side of the issue. Let’s try to find some different arguments and opinions on the issues than were presented yesterday.”

## Modeling / Guided Practice

1. Read the rules of the debate / academic controversy
2. Divide the class into two groups (the same groups that were assigned in the previous class session.
3. Check for understanding.
4. Hand each team a topic sheet.
5. Remind the students that you will be looking for different arguments than were presented in the last class.

## **Modeling / Guided Practice**

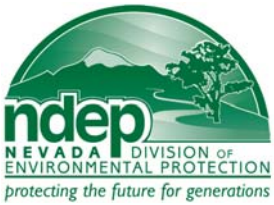
5. Let the students know they should use all of their notes.
6. The students should discuss their question with their teammates.
7. After 30 minutes regain the attention of the class.
8. The teacher should return to the front of the class, with the teams on either side of the room.
9. Begin the debate
10. When all of the arguments are presented and rebutted, end the debate.
11. Have the students fill out the debate rubric for the other team.

### **Closure:**

1. Emphasize some of the responses that the students gave.
2. Emphasize good behavior during the academic controversy.
3. Let students know they will be arguing the other side of the argument next time

### **Independent Practice**

1. Not applicable.



### Support Document

### Debate Rules

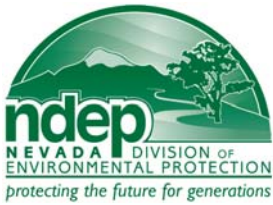
# Socrates Static

## Oral Assessment: Debate Day 2

### Rules to live by:

Be critical of ideas not people.  
Do not focus on winning—the purpose of the exercise is to learn.  
Participation strongly encouraged.  
Listen to everyone's ideas.  
Try to understand both sides of the issue.  
Keep behavior under control.

1. Divide into two groups.
2. Each half of class is given a topic that is to be discussed.
3. Teams separate to prepare their arguments.
4. Each team has 30 minutes to prepare an argument.
5. The two teams come back together.
6. One team (chosen by the teacher) presents an argument.  
There is a 5 minute time limit.  
Opposite team may not interrupt or speak.
7. The remaining team presents their counter-argument .  
(see rubric for expectations)  
There is a 5 minute time limit.  
Opposite team may not interrupt or speak.
8. This presentation / rebuttal session shall continue to go back and forth until the students have exhausted all arguments.



# Socrates Static

## Oral Assessment: Debate

### Topic

I want to start a recycling program at your school. There are some people that agree with me and some who say a recycling program is a waste of time.

### Team A:

Argue that a recycle program is a waste of time and resources. Include reasons why a recycle program should not be set up at your school. Use facts and opinions based on what you have learned from this class.

### Team B:

Argue that a recycle program is a good idea. Include reasons why we should start one and how we might set up a program. Use facts that you have learned from this class.





Teacher Copy – For scoring each side of the debate

### Socrates Static-- Debate Rubric

	<b>0</b>	<b>Needs Work 1</b>	<b>Approaching Expectations 2</b>	<b>Meets Expectations 3</b>
<b>Respect for Other Team</b>	Statements, responses and/or body language were consistently not respectful.	Most statements and responses were respectful and in appropriate language, but there was one sarcastic remark.	Statements and responses were respectful and used appropriate language, but once or twice body language was not.	All statements, body language, and responses were respectful and were in appropriate language.
<b>Information</b>	Information had several inaccuracies OR was usually not clear.	Most information presented in the debate was clear and accurate, but was not usually thorough.	Most information presented in the debate was clear, accurate and thorough.	All information presented in the debate was clear, accurate and thorough.
<b>Rebuttal</b>	Counter-arguments were not accurate and/or relevant	Most counter-arguments were accurate and relevant, but several were weak.	Most counter-arguments were accurate, relevant, and strong.	All counter-arguments were accurate, relevant and strong.

Lesson 20

## Socrates Static: Day 2

Date: \_\_\_\_\_

**Socrates Static-- Debate Rubric**

	<b>0</b>	<b>Needs Work 1</b>	<b>Approaching Expectations 2</b>	<b>Meets Expectations 3</b>
<b>Use of Facts/Statistics</b>	Every point was not supported.	Every major point was supported with facts, statistics and/or examples, but the relevance of some points were questionable.	Every major point was adequately supported with relevant facts, statistics and/or examples.	Every major point was well supported with several relevant facts, statistics and/or examples.
<b>Presentation Style</b>	One or more members of the team had a presentation style that did not keep the attention of the audience.	Team sometimes used gestures, eye contact, tone of voice and a level of enthusiasm in a way that kept the attention of the audience.	Team usually used gestures, eye contact, tone of voice and a level of enthusiasm in a way that kept the attention of the audience.	Team consistently used gestures, eye contact, tone of voice and a level of enthusiasm in a way that kept the attention of the audience.
<b>Organization</b>	Arguments were not clearly tied to an idea (premise).	All arguments were clearly tied to an idea (premise) but the organization was sometimes not clear or logical.	Most arguments were clearly tied to an idea (premise) and organized in a tight, logical fashion.	All arguments were clearly tied to an idea (premise) and organized in a tight, logical fashion.
<b>Understanding of Topic</b>	The team did not show an adequate understanding of the topic.	The team seemed to understand the main points of the topic and presented those with ease.	The team clearly understood the topic in-depth and presented their information with ease.	The team clearly understood the topic in-depth and presented their information forcefully and convincingly.

**Socrates Static-- Debate Rubric****Team A Score**

	SCORE
<b>Respect for Other Team</b>	
<b>Information</b>	
<b>Rebuttal</b>	
<b>Use of Facts/Statistics</b>	
<b>Presentation Style</b>	
<b>Organization</b>	
<b>Understanding of Topic</b>	

Total points earned:	Total possible:	Percent:
	<b>21</b>	

**Solid Waste and Recycling Curriculum**  
**Lesson 20**

**Name:** \_\_\_\_\_

**Socrates Static: Day 2**

**Date:** \_\_\_\_\_

**Socrates Static-- Debate Rubric**

**Team B Score**

	SCORE
<b>Respect for Other Team</b>	
<b>Information</b>	
<b>Rebuttal</b>	
<b>Use of Facts/Statistics</b>	
<b>Presentation Style</b>	
<b>Organization</b>	
<b>Understanding of Topic</b>	

Total points earned:	Total possible: <b>21</b>	Percent:
----------------------	------------------------------	----------

Lesson 20

## Socrates Static: Day 2

Date: \_\_\_\_\_

**Objectives:** I will participate in an academic debate.  
 I will work in groups to prepare for the debate.  
 I will review and use information presented in this class.

**Socrates Static-- Debate Rubric**

	<b>0</b>	<b>Needs Work 1</b>	<b>Approaching Expectations 2</b>	<b>Meets Expectations 3</b>
<b>Respect for Other Team</b>	Statements, responses and/or body language were consistently not respectful.	Most statements and responses were respectful and in appropriate language, but there was one sarcastic remark.	Statements and responses were respectful and used appropriate language, but once or twice body language was not.	All statements, body language, and responses were respectful and were in appropriate language.
<b>Information</b>	Information had several inaccuracies OR was usually not clear.	Most information presented in the debate was clear and accurate, but was not usually thorough.	Most information presented in the debate was clear, accurate and thorough.	All information presented in the debate was clear, accurate and thorough.
<b>Rebuttal</b>	Counter-arguments were not accurate and/or relevant	Most counter-arguments were accurate and relevant, but several were weak.	Most counter-arguments were accurate, relevant, and strong.	All counter-arguments were accurate, relevant and strong.

Lesson 20

## Socrates Static: Day 2

Date: \_\_\_\_\_

**Socrates Static-- Debate Rubric**

	<b>0</b>	<b>Needs Work 1</b>	<b>Approaching Expectations 2</b>	<b>Meets Expectations 3</b>
<b>Use of Facts/Statistics</b>	Every point was not supported.	Every major point was supported with facts, statistics and/or examples, but the relevance of some points were questionable.	Every major point was adequately supported with relevant facts, statistics and/or examples.	Every major point was well supported with several relevant facts, statistics and/or examples.
<b>Presentation Style</b>	One or more members of the team had a presentation style that did not keep the attention of the audience.	Team sometimes used gestures, eye contact, tone of voice and a level of enthusiasm in a way that kept the attention of the audience.	Team usually used gestures, eye contact, tone of voice and a level of enthusiasm in a way that kept the attention of the audience.	Team consistently used gestures, eye contact, tone of voice and a level of enthusiasm in a way that kept the attention of the audience.
<b>Organization</b>	Arguments were not clearly tied to an idea (premise).	All arguments were clearly tied to an idea (premise) but the organization was sometimes not clear or logical.	Most arguments were clearly tied to an idea (premise) and organized in a tight, logical fashion.	All arguments were clearly tied to an idea (premise) and organized in a tight, logical fashion.
<b>Understanding of Topic</b>	The team did not show an adequate understanding of the topic.	The team seemed to understand the main points of the topic and presented those with ease.	The team clearly understood the topic in-depth and presented their information with ease.	The team clearly understood the topic in-depth and presented their information forcefully and convincingly.

**Topic**

**I want to start a recycling program at your school. There are some people that agree with me and some who say a recycling program is a waste of time.**

**Team A:**

**Argue that a recycle program is a waste of time and resources. Include reasons why a recycle program not be set up at your school. Use facts and opinions based on what you have learned from this class.**

**Team B:**

**Argue that a recycle program is a good idea. Include reasons why we should start one and how we might set up a program. Use facts that you have learned from this class.**

**Solid Waste and Recycling Curriculum**

**Lesson 20**

**Socrates Static: Day 2**

**Name:**\_\_\_\_\_

**Date:**\_\_\_\_\_

**Initial Arguments**



**Solid Waste and Recycling Curriculum**

**Lesson 20**

**Socrates Static: Day 2**

**Name:**\_\_\_\_\_

**Date:**\_\_\_\_\_

**Counter-argument**

**Socrates Static-- Debate Rubric****Team Score**

	SCORE
<b>Respect for Other Team</b>	
<b>Information</b>	
<b>Rebuttal</b>	
<b>Use of Facts/Statistics</b>	
<b>Presentation Style</b>	
<b>Organization</b>	
<b>Understanding of Topic</b>	

Total points earned:	Total possible: <b>21</b>	Percent:
----------------------	------------------------------	----------